CLAIMS

1. A block copolymer mixture containing a branched block copolymer as the main component, characterized in that the block copolymer mixture comprises from 55 to 95 mass% of a vinyl aromatic hydrocarbon and from 5 to 45 mass% of a conjugated diene as monomer units, a linear block copolymer prior to coupling is formed by coupling living active site represented by the following formulae:

S1-B-Li

S2-B-Li

S3-B-Li

(wherein each of S1, S2 and S3 is a polymer block comprising a vinyl aromatic hydrocarbon as monomer units, B is a polymer block comprising a conjugated diene as monomer units, and Li is a living active site comprising lithium, and the number average molecular weights are S1>S2>S3), and further, (1) molecular weight distribution (Mw/Mn) of a mixture of the polymer blocks S1, S2 and S3 each comprising a vinyl aromatic hydrocarbon as monomer units is within a range of from 3,25 to 6, and (2) in a gel permeation chromatogram of the mixture of the polymer blocks S1, S2 and S3, M1/M3 is within a range of from 13 to 25, and M2/M3 is within a range of from 2 to 4, where M1, M2 and M3 are peak top molecular weights of components corresponding to S1, S2 and S3, respectively.

2. The block copolymer mixture according to Claim 1, which comprises the branched block copolymer in an amount

of from 65 to 90 mass%.

3. The block copolymer mixture according to Claim 1 or 2, wherein the proportion of the number of moles of S1 to the total number of moles of S1, S2 and S3 is within a range of from 2 to 30 mol%.

4. The block copolymer mixture according to any one of Claims 1 to 3, wherein in the gel permeation chromatogram of the mixture of the polymer blocks S1, S2 and S3, the peak top molecular weight M1 corresponding to S1 is within a range of from 80,000 to 220,000, the peak top molecular weight M2 corresponding to S2 is within a range of from 14,000 to 25,000, and the peak top molecular weight M3 corresponding to S3 is within a range of from 3,000 to 12,000.

5. The block copolymer mixture according to any one of Claims 1 to 4, wherein in a gel permeation chromatogram of the block copolymer mixture containing a branched block copolymer, the molecular weight distribution (Mw/Mn) of the peak at which the peak top molecular weight becomes minimum among peaks which satisfy the following (a) and (b), is less than 1.03:

(a) the peak top molecular weight is within a range of from 20,000 to 50,000, and

(b) the proportion of the area is within a range of from 3 to 15% to the whole peak area.

6. The block copolymer mixture according to any one of Claims 1 to 5, wherein in a gel permeation chromatogram

of the block copolymer mixture containing a branched block copolymer, the proportion of the area of the peak at which the peak top molecular weight becomes maximum among peaks at which the peak top molecular weight is within a range of from 200,000 to 380,000, is from 2 to 10% to the whole peak area.

7. The block copolymer mixture according to any one of Claims 1 to 6, wherein in a gel permeation chromatogram of a mixture of copolymers S1-B, S2-B and S3-B, each comprising a polymer block comprising a vinyl aromatic hydrocarbon as monomer units and a polymer block comprising a conjugated diene as monomer units, M4/M6 is within a range of from 4.5 to 9, and M5/M6 is within a range of from 1.3 to 1,8, where M4, M5 and M6 are peak top molecular weights of components corresponding to S1-B, S2-B and S3-B, respectively.

8. The block copolymer mixture according to any one of Claims 1 to 7, wherein a component providing the maximum peak area in the gel permeation chromatogram of the block copolymer mixture containing a branched block copolymer, has a peak top molecular weight of from 170,000 to 300,000.

9. The block copolymer mixture according to any one of Claims 1 to 8, which is formed by coupling using an epoxidized oil.

10. The block copolymer mixture according to Claim 9, wherein the epoxidized oil is epoxidized soybean oil.

11. The block copolymer mixture according to Claim 9 or 10, wherein the proportion of the number of moles of an open epoxy group residue present in an epoxidized oil residue in the branched block copolymer is less than 0.7 to the total number of moles of epoxy groups and the open epoxy group residue present in the epoxidized oil residue.

12. A thermoplastic resin composition comprising the block copolymer mixture as defined in any one of Claims 1 to 11 and a thermoplastic resin other than the block copolymer mixture.

13. The thermoplastic resin composition according to Claim 12, wherein the thermoplastic resin is a styrene resin.